HOW DO GENERAL EDUCATION TEACHERS (K-5TH GRADE) IN THE MAT-SU BOROUGH SCHOOL DISTRICT TEACH HANDWRITING SKILLS FOR AUTOMATICITY

By

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Abstract

In 2012 the State of Alaska adopted English Language Arts Standards with no handwriting standards beyond the first grade. This change does not display an understanding of how students develop handwriting skills, nor the importance of a student's ability to write with automaticity. The stage many students make the greatest gains in handwriting fluency is at the intermediate level (grades 3-5). This study surveyed kindergarten through fifth grade general education teachers in the Matanuska-Susitna Borough School District to learn if handwriting skills are being taught and what instructional methods are being used to develop automaticity.

This study found that teachers in the Mat-Su Borough School District think handwriting instruction is important but, there are no common standards, curriculum, or materials. In addition, only 24% of the teachers are using the best instructional methods to develop handwriting automaticity. In the Mat-Su Borough School District the importance of handwriting instruction seems to be overlooked. The district needs to provide additional professional development on handwriting instruction, develop vertically aligned standards for handwriting, and provide resources for schools to purchase research-based materials.

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Chapter 1 Introduction

The Alaska English Language Arts Standards (adopted in 2012) have a glaring hole. The standards followed the guidelines for handwriting instruction of the Common Core State Standards of 2010, and the teaching of cursive writing (joined up letters which does not require the writer to lift the implement off the page) is completely absent, and there are only a few standards regarding handwriting at all (Alaska Department of Education & Early Development, 2012). Since adopting the Common Core State English Language Arts Standards, eleven states have passed legislation to bring back cursive handwriting instruction (Garibaldi & Harralson, 2016). Alaska has not.

The Alaska standards only explicitly address handwriting in kindergarten and first grade and only require mastery of the printing of all upper- and lowercase letters. Beyond first grade there is no reference to handwriting other than such phrases as "Form and use…". For example, second grade standard L.2.1.b states, "…form and use frequently occurring irregular plural nouns." (Alaska Department of Education & Early Development, 2012). These language standards, however, do include the use of technology within the writing standards. Technology use is included from kindergarten to fifth grade, when the writing standard W.5.6 states that students should demonstrate sufficient command of keyboarding skills to type a minimum of two pages in a single sitting (Alaska Department of Education & Early Development, 2012). This shift could create a large gap in the development of writing skills and may have an adverse effect on the students of Alaska.

The curriculum within the Mat-Su Borough School District for Literacy Standards does includes handwriting standards at the primary level but only in kindergarten. Cursive is introduced at the intermediate level in third grade and continues through the fifth grade. There is no mention of handwriting within the literacy standards in first or second grade. The kindergarten standard states, "HW.K.1 Demonstrate correct manuscript letter formation," with the object of students being able to "Form correct manuscript letters with proper proportion, alignment and grip." In third grade the curriculum standard states, "HW.3.1 Write routinely in cursive," and includes the objectives of, "Write in cursive with sufficient flow, ease and speed to support legibility, and enough stamina to produce written

text, with appropriate scaffolding." The standard and the objectives for handwriting in fourth and fifth grade remain the same except for increasing the amount of work produced so that by fifth grade students will publish their writing in cursive.

The ability to express oneself through writing is a key component to life. Not only is it essential for success in school, it is also an important skill in functioning in daily life and many work environments. The process of writing includes two distinct parts: text generation and transcription. Text generation is the composition of the thought wished to be communicated, while transcription is the act of creating the words on the page. Transcription includes both handwriting (letter production) and spelling (word production) (Swanson & Berninger, 1996). Both transcription and text generation require short-term memory capacity, which is a scarce and limited resource. It is theorized that if a writer has developed their transcription skills to a state of automaticity, then more short-term memory capacity is available for text generation (Medwell & Wray, 2007). Students in grades 3 through 5 - also referred to as upper elementary or intermediate students - may still need more practice in handwriting skills to achieve automaticity (Wicki et al., 2014). Yet, during the 2018-2019 school year, the state of Alaska had more than 40,000 elementary students enrolled in second through fifth grade who were no longer required to receive handwriting instruction (Alaska Department of Education & Early Development Data Center, 2019). Thus, the purpose of this study is to determine how in light of this dramatic shift of expectations, elementary teachers within the Mat-Su Borough School District teach handwriting for automaticity. The research study surveyed 85 kindergarten through fifth grade general education teachers in the 21 Mat-Su Borough School District elementary schools via an electronic survey to examine if and how they teach handwriting skills for automaticity.

Chapter 2 Literature Review and Research Questions

This literature review discusses what researchers have found over the years in regard to the importance of the development of automatic handwriting for students, the instructional methods that help students develop automatic writing, and the continued need for teachers to teach handwriting skills for automaticity in the era of technology.

2.1 Research on handwriting and the competition for short-term memory capacity

Since the 1980s in both England and the United States, writing instruction has emphasized teaching children to write meaningful texts as evidence for learning, even before they've mastered the writing system. According to Medwell and Wray (2007), focus is placed on emergent writing and children's ability to create meaning regardless of letter formation and legibility. For older children, the teaching of writing has changed from transcribing text (copying information) to composing text (using information to make meaning) and has been taught with an emphasis on the process of writing and the teaching of genre specific text structures (Medwell & Wray, 2007). This can be seen today in the English Language Arts standards of the State of Alaska. For instance, in kindergarten writing standard W.K.2 states, "…use a combination of drawing, dictating, and writing to compose informative/explanatory texts in which they name what they are writing about and supply some information about the topic," (Alaska English Language Arts Standards, 2012, p. 28). There are many Alaska standards at the primary level, that ask students to dictate, act out, tell, or describe a story, a response to a question, or even to find the verb in a sentence. But there is only one standard specifically targeting handwriting: L.K.1.a, "Demonstrate command of the conventions of standard English grammar and usage when writing or speaking; a. Print many upper- and lowercase letters," (Alaska English Language Arts Standards, 2012, p. 38). The Matanuska-Susitna Borough School District does include additional handwriting standards in its literacy curriculum (reference), but the emphasis remains on emergent writing over specific handwriting skills at the primary level.

In 2007, Medwell and Wray thought it was time to reevaluate the importance of teaching handwriting in England. The substantial amount of research on the teaching practices of handwriting in

the mid-1980s and early 1990s indicated there is a strong link between correct spelling and fluent joined-up handwriting. Specifically, these researchers found a link between the kinesthetic movement of the hand and eye that helped the learning of common spelling patterns. Medwell and Wray (2007) went on to conclude that in England educators had emphasized the benefits of spelling and well-formed joined handwriting, while neglecting the need to teach for automaticity, a skill that also supports composing.

Many students are not identified as having writing difficulties until upper elementary school (third, fourth, or fifth grade) when the writing tasks and expectations become more difficult and require students to express themselves rather than copying text (Brooks et al., 1999). Students in third through fifth grade may still need more practice in handwriting skills to achieve automaticity. In their study, Wicki et al. (2014) found that handwriting instruction tends to focus on legibility of letters and neatness but often neglects the practice which promotes automaticity and fluency. Wicki et al. (2014) used previous studies to make the case that there are considerable developmental changes in fluency improvement in children age 7 to 10 years compared to children older than 10. The study confirmed speed is influenced by automation and stated that fluent writing, not just legibility and letter formation, needs to be taught in schools. Automaticity can be defined as "having been achieved when a process can be effected swiftly, accurately and without the need for conscious attention," (Medwell & Wray, 2007, p. 3).

Writing fluency is only one part of handwriting transcription. As Berninger (2009) states, "…spelling is a bridge that translates ideas generated during planning into language at the word level by the scribe…" (Berninger, 2009, p. 77). She describes this process as the orthographic loop. The orthographic loop is the complete process of writing and includes both letter and word generation to create meaning. Children must first write individual letters to form words. These words, when combined with other words, form sentences. The sentences when combined with other sentences form text. Spelling is the bridge that allows authors to communicate their thoughts in writing and has been found to be the most consistent longitudinal predictor of writing success and writing-reading connections from first to seventh grade (Abbott et al., 2010).

Medwell and Wray (2007) also examined research on writing and working memory. Working memory is a limited but vital resource in the writing models researchers have developed. As a scarce resource, the two distinct writing processes (handwriting and composing) must compete for this resource. Even though models of writing suggest it is not a sequential process, educators teach writing composition as a sequential list of tasks (planning, drafting, revising, etc.) but seemingly ignore that handwriting is also a task that must be accomplished at the same time.

Studies suggest a solution to the competition for working memory is to have handwriting as an automatic process. In their study, Hier and Eckert (2014), state,

> From a cognitive perspective, the ability to write fluently allows children to expend fewer cognitive resources on basic writing components, and thus more cognitive resources may be used for other, higher-level writing components such as composition planning and content knowledge, (p. 489).

McCarney et al. (2013) also studied poor handwriting as an indicator for literacy potential in primary school in the United Kingdom. Their study found students benefit from tactile feedback when handwriting, and that handwriting may help children develop orthographic representations (letter, sound, symbol relationships), which leads to writing automaticity. In their study, McCarney et al. (2013), looked at the associations between handwriting, working memory, Intelligence Quotient (IQ), and literacy scores. The results of this study indicate children with poor or very poor handwriting tend to have lower IQ scores, reduced working memory capacity, and lower scores for reading and spelling. The longer it took participants to complete the handwriting tasks and the poorer the legibility of the work produced. This indicates they are using their working memory to complete the tasks and have not yet reached a level of automaticity. Findings reveal without enough additional practice to gain automaticity these students may continue to struggle in these and other areas (McCarney et al., 2013).

2.2 Research on instructional practices in the classroom

Given that automatic handwriting and spelling are the foundational skills a student needs to compose texts, the question becomes what types of instructional practices should teachers use to help

students develop automatic handwriting? A large-scale study of first graders found the most effective way to teach automatic legible letter writing was using number arrow cues plus writing from memory (Berninger et al., 1997). This method showed improved compositional fluency and eliminated reversals.

Fitzpatrick et al. (2013) evaluated how the instructional practice of teachers impacts student progress in learning handwriting and noted that handwriting is used throughout the school day. However, some schools may be suggesting the use of technology as an intervention for students with writing difficulties. Research indicates that handwriting and typing are not equivalent (Berninger et al., 2009, Mueller & Oppenheimer, 2014). Handwriting leads to superior letter recognition and the tactile feedback activates multiple areas in the brain. Fitzpatrick's et al. (2013) quasi-experimental study sought to evaluate the role of intrinsic and extrinsic factors in promoting handwriting development, explored similarities and differences between process and product measures in handwriting performance, and sought to determine how instructional practices in classrooms impact handwriting performance. The research found that intrinsic and extrinsic factors influenced handwriting performance but in different ways. Specifically, findings show that the relationship between the smoothness of the movements (resulting in less hand-in-the-air time) and the measure of fluency (how many words written in a minute) suggest the importance of automaticity (Fitzpatrick et al., 2013). As to the question of teacher instructional practices, Fitzpatrick et al. (2013) found that all children's handwriting improved, but the gap in the amount of the improvement was different between the two test groups: a slow-paced instructional group and a moderate-paced instructional group (Fitzpatrick et al., 2013). The students who received faster paced instruction may have received more opportunities to practice and showed more improvement than the slower-paced group. In addition to finding that students who received more opportunities to practice showed more improvement, Fitzpatrick et al., (2013) found that the activity of writing from memory may be important in writing instruction, and that writing curriculums should focus more on fluency than on neatness or legibility. There was no significant difference between the use of lined or unlined paper. This study suggested that more studies in actual classroom settings were needed to

evaluate teaching practices and continue to determine how best to differentiate instruction (Fitzpatrick et al., 2013).

2.3 Research on the need to teach handwriting in the era of technology

Is there a need to continue to teach handwriting in this era of technology? Yes. Research indicates that even though students have more access to technology to complete writing tasks there is still a need to teach handwriting. In their study of a comparison of pen and keyboarding transcription of children with and without disabilities, Berninger et al. (2009) found that all children (with and without disabilities) composed longer essays and at a faster rate of speed by pen than by keyboard; and findings also showed that fourth and sixth graders wrote more complete sentences when writing by pen than by keyboard (Berninger et al., 2009). These researchers cautioned that accommodations in the form of using keyboards are not a substitute for explicit instruction in transcription for students with handwriting and spelling disabilities. In a more recent meta-analytic review of handwriting and keyboarding, Feng et al. (2017), found that handwriting fluency was significantly correlated with keyboarding fluency, but the research also still supports handwriting instruction is important because of the link between handwriting fluency and spelling. This meta-analytic study indicates that "handwriting is still critical for students' writing development, and should be explicitly instructed," (Feng et al., 2017, p. 25).

2.4 Purpose of the study and research questions

The review of the research indicates that there is a need to continue to teach handwriting to students even though the Alaska English Language Arts Standards adopted in 2012 places a greater emphasis on the use of technology. There is much evidence to suggest handwriting automaticity helps students improve spelling and provides them with more short-term memory capacity to attack the higher-level writing skills of planning, revising, and editing (Medwell & Wray, 2007). Research has also shown students may continue to benefit from handwriting instruction beyond the primary level and that the greatest time for developmental increase in writing fluency is between 7 and 10 years of age (Wicki et al., 2004). In addition, teachers may need to change instructional practices to ensure they are teaching for automaticity and providing students with appropriate practice. The use of number arrow cues plus writing

from memory when teaching handwriting is believed to be the most effective way to teach legible and automatic letter writing (Berninger, 2009). Given the importance of teaching handwriting, it is important to understand how teachers are teaching.

This research used a mixed method (open-ended and closed question) survey to examine how kindergarten through fifth grade teachers in the 21 elementary schools in the Mat-Su Borough School District teach handwriting skills for automaticity to answer these two questions:

- Are teachers teaching handwriting skills at the primary and intermediate levels?
- What instructional methods are being used in the classroom to develop automaticity?

Chapter 3 Methodology

How could I find out (if and how) teachers in the Mat-Su Borough School District continue to teach handwriting skills, what teaching practices or methods they use in their classrooms, and are these the methods that help students develop automatic handwriting? This chapter discusses my approach to the research, why I chose to use a survey, and the methods used to collect and analyze the survey data.

3.1 Research paradigm

In this study I used a postpositivist framework with a constructivist paradigm in my mixed-method survey (Lincoln et al., 2011). I believe I did not have to rely solely upon quantifiable results that a survey with only closed questions would provide. The survey was written with a quantitative perspective with an acceptance of qualitative data because I believe as O'Leary (2014) states, "Researchers who think this way tend to accept the underlying assumptions of the quantitative tradition, but also accept that some qualitative data might help 'flesh out' their study" (p. 23). I used the qualitative tradition of a mixed-method survey that included both open-ended and closed questions so I could try to discover why teachers choose the methods of instruction they use to teach handwriting skills. My constructivism paradigm comes from my belief that people construct their knowing from their lived experiences and I agree with Lincoln et al. (2011) that our reality is self-created and shaped by these experiences. I believe people use their lived experiences to create their own realities and then use these realities to guide their actions. Teachers have their own opinions about the importance of teaching handwriting based on their lived experiences, and I wonder to what extent these beliefs and experiences influence how they teach handwriting.

3.2 Survey design

This study used what Creswell (2018) describes as a cross-sectional survey design to collect data from participants during a specific period of time and allowed me to describe the opinions and practices of the participants. This survey design was chosen because of the large geographical area served by this school district and the large number of general education teachers employed. The survey allowed for current opinions and practices about teaching handwriting to be collected in a reasonable period of time.

The Mat-Su Borough School District is about the size of West Virginia and with an area this vast, logistics and practicality, unfortunately must be overcome. In order to do this, an electronic survey was used to collect the quantitative and qualitative data through both closed and open-ended questions.

The size of the schools within the Mat-Su Borough School District varies drastically. Some of the schools have 20 general education teachers on staff, while others have two. With such a small number of teachers on staff at some of the schools, it was prudent to avoid collecting potentially identifiable information. This was also a concern of the Mat-Su Borough School District administration and it was requested that the survey refrained from asking about school location and instead ask only which grade level the teacher taught.

The survey was confidential, voluntary, and participation was not detrimental to anyone's teaching position. It began with an informed consent and required participants to agree by selecting the "Next" button before beginning the survey. It included 17 questions under four different areas: handwriting instruction, programs and materials, opinions on handwriting instruction, and final thoughts. The survey included both open and closed-ended questions. At the completion of the survey, participants were able to view the aggregate quantifiable data that was collected. A copy of the survey is included in Appendix C.

3.3 Participants

This study sought to find out if the approximately 270 general education teachers in grades kindergarten through fifth grade in the Mat-Su Borough School District continue to teach handwriting skills, if there are trends in instructional methods being used to teach handwriting, and if these instructional practices use research-based methods known to develop handwriting automaticity. The survey participation rate was approximately 31% with 85 educators completing the survey (see Table 3.1). Of the 85 participants, 48 of them (56%) teach a single grade at the primary level, 28 participants (33%) teach an intermediate level class, and nine participants (11%) indicated that they teach in a multi-grade classroom that may span between primary and intermediate levels. A limitation of this study was not asking which grade level these multi-age teachers teach. Therefore, these nine responses are included

in the overall data, but left out of the data analysis that compares primary grades to intermediate grades. This limitation of the study will be addressed later.

Table 3.1

Survey Participants and Grade Level

Grade Level	K	1st	2nd	3rd	4th	5th	Multi-Age
Number of Participants	14	22	12	7	10	11	9
% of Participants		48 Primary 56%			28 Intermediate 33%		9 Multi-age 11%

3.4 Data collection and analysis

The study used an electronic survey, created using a Google Form, as the collection method of the confidential survey responses. The survey was delivered to the general education elementary teachers using an electronic link distributed via an email from each school's instructional coach. Instructional coaches were informed at their monthly meeting that they would be asked to help distribute the survey through emails to their general education teachers at their school site. An original email with the electronic link was sent to all 21 instructional coaches when the survey window opened requesting that they forward it to their general education teachers in grades K-5th. This was an important step because the Mat-Su Borough School District has recently increased its email security system and all unknown email, or unexpected emails, are to be deleted or reported to the IT department as a phishing alert. Therefore, an email from a known individual within the building, had a higher chance of the survey link being received by the teachers. The survey response window was open for three-and-a-half weeks and the original email was followed-up with two reminder emails, one each week thereafter. These additional reminders were crucial in reaching the 31% participation rate achieved in this study.

The evaluation of the survey response data follows Fowler's (2014) recommendation for data analysis. Upon completion of the survey, the responses were downloaded into an Excel spreadsheet maintained on a password-protected Google Drive through the University of Alaska Fairbanks. An initial coding of the data was completed and the data was inspected for glaring discrepancies and cleaned. The

data cleaning process included adding "NA" to responses that were left blank if the participant had indicated they did not teach handwriting skills and had skipped the question. It was also noticed that one response was dated in October, before the survey window opened, and must have been left from a trial done while creating the survey. This response was deleted from all the data on the Excel spreadsheet bringing the number of total participants down to 85. Descriptive analysis were used to determine the response rate, 31%, and to report the aggregate responses to the questions and discern patterns of responses and variations within the results (Creswell, 2018).

To complete the initial coding of the data collected through the open-ended question, I first read through the responses in their entirety and noticed that there were some similarities. On the second reading of the responses, I labeled the descriptions with notes about these similarities. On the third reading of the responses, I refined the labels and identified and themes. Identified themes included comments regarding teachings practices, the use of technology in the classroom, teaching cursive, and the need for vertical alignment when teaching handwriting.

3.5 Ethical considerations and study limitations

This research thesis was completed in partial fulfillment of the requirements for the Master of Education degree in Elementary Education through the University of Alaska Fairbanks and was reviewed and approved by the University of Alaska Fairbanks' Office of Integrity, Institutional Review Board (IRB# 1516707-1). A copy of the approved IRB Protocol is included in Appendix A. The survey was voluntary and was not part of any job assignment. The instructional coaches were invited to forward the link with the survey to their general education teachers, but they were not required to do so. The teachers who received an email with the link, were not required to complete the survey. After the survey window closed, the responses were downloaded into a spreadsheet and kept confidential and identified only by a date and time stamp. The data was stored on UAF's password-protected Google Drive.

Before discussing the findings, it is important to note the potential limitations of this study. First, findings do not not represent all elementary general education teachers in the Mat-Su Borough School District. Teachers self-selected to participate in the survey, thus, it was not a randomized sample of these

teachers in the school district. Second, because of the need to protect identifiable information from teachers who teach at small schools, the study did not capture the school affiliation of the teacher respondents. Therefore, there is no way to ensure all 21 elementary schools have representation within the data. Third, all elementary grade levels are represented, but not at the same participation level. The primary grades (K-2) have a greatest representation of 56% of all respondents (48), while intermediate grades (3-5) represent 33% of the respondents (28), and the multi-age grade level represents 11% of the data (9). Not asking the multi-age grade level teachers which grade they specifically teach was a mistake. Because the grade levels are unknown for these teachers, the responses from the nine multi-age respondents could not be used when comparing the primary and intermediate grade levels. The responses from these multi-age grade level teachers were, however, included in the overall findings.

3.6 Summary of methodology

This study used a cross-sectional survey design to identify trends in the opinions and instructional practices of teaching handwriting by elementary general education teachers in the Mat-Su Borough School District. A link to an electronic survey was sent out to all 270 general education teachers, 85 teachers responded with a participation rate of 31%. Descriptive statistics were used to identify trends in responses to survey items. Open-ended data was qualitatively analyzed in order to identify themes in participant opinions about handwriting instruction.

Chapter 4 Results

The results of this study are presented here and follow the four sections of the survey: methods used to teach handwriting, programs and teaching materials used to teach handwriting, opinions about handwriting instructions, and final thoughts.

4.1 Instructional methods of handwriting

The first section of the survey asked questions designed to measure facts about if and how the teachers in the Mat-Su Borough School District teach handwriting in their classrooms. It included questions about which grades they teach, the type of handwriting they teach (print or cursive), how often they teach handwriting, the average length of a handwriting lesson, and what instructional practices they use when they teach handwriting.

To answer the question, "Do general education elementary teachers still teach handwriting?" the survey began by asking which style of handwriting is taught. The options included print, cursive, keyboarding, and "I do not specifically teach handwriting." Participants could select all that apply. The data from all 85 responses (see Table 4.1) indicate 70%, or 60 teachers, teach print handwriting, cursive is taught by 33%, or 28 teachers, and keyboarding is taught by 22%, or 18 teachers. Six percent of all the teachers (5) indicated that they do not specifically teach handwriting skills at all. It was interesting to note that 17%, or two of the second-grade teachers and 18%, or two of the fifth-grade teachers are represented in this 6% response.

When the responses are broken down into the primary and intermediate levels, 96%, or 46 primary teachers and 36%, or 10 intermediate teachers teach print. No primary teachers teach cursive, while 82%, or 23, intermediate teachers do. Keyboarding was included in the survey because of its emphasis in the current Alaska English Language Arts standards and the study looked to determine if those who teach keyboarding also teach handwriting skills. Of those who teach keyboarding skills, 18 teachers, or 100% of them, indicated that they teach print or cursive handwriting skills as well.

Table 4.1

Types of Handwriting Taught

		Primary Level			Intermediate Level			
Grade Level and Total Participants	Number and % All Responses	K 14	1st 22	2nd 12	3rd 7	4th 10	5th 11	Multi-Age 9
Print	60 71%	22 100%	22 100%	10 83%	3 43%	1 10%	3 27%	7 78%
Cursive	28 33%	0 0%	0 0%	0 0%	7 100%	9 90%	7 64%	5 56%
Keyboarding	18 22%	0 0%	0 0%	2 17%	3 43%	4 40%	6 55%	3 33%
I do not teach handwriting	5 6%	0 0%	0 0%	2 17%	0 0%	1 1%	2 18%	0 0%

In response to the question, "How often do you teach a handwriting lesson?," 29%, or 25 teachers indicated that they teach handwriting skills daily, 31%, or 26 teachers selected 2 to 3 times a week, 8%, or 7 teachers selected weekly, 5%, or 4 teachers selected not at all, and 14%, or 12 teachers selected other (see Table 4.2). Of the 12 respondents who selected "other," 10 of them indicated that they teach handwriting more often at the beginning of the year than they do later in the year, and most referred to daily practice during this time. A majority of all teachers (51, or 60% when including multi-age) indicated that they teach handwriting skills daily or 2 to 3 times a week.

Table 4.2

How Often Handwriting is Taught

	Total Participants	Primary (K-2)	Intermediate (3-5)
	85	48	28
Daily	25	19	2
	29%	40%	7%
2 to 3 times a week	26	15	9
	31%	31%	32%
Weekly	7	2	4
	8%	4%	14%
Occasionally	11	3	7
	13%	6%	25%
Not at all	4	2	2
	5%	4%	7%
Other	12	7	4
	14%	15%	14%

The data shows a stark difference in instructional frequency between primary and intermediate grade levels. The primary teachers teach handwriting skills much more often than the intermediate teachers, with 20 teachers, 71%, indicating they teach daily or 2 to 3 times a week, while only 11 intermediate teachers, 39%, reported that same frequency. Nine intermediate teachers, 32%, indicated that they only teach handwriting skills occasionally or not at all.

A typical handwriting lesson lasts less than 30 minutes. Forty-three teachers, 51%, spend less than 15 minutes per lesson, and 36 teachers, or 42% of teachers indicated the lesson in their class lasts between 15 to 30 minutes. The results from the intermediate and primary levels are very similar, with 46% of the intermediate teachers and 50% of the primary teachers choosing less than 15 minutes; and 40% of primary and 50% of intermediate teachers choosing 15 to 30 minutes for the lesson length.

This survey asked which instructional methods were used to teach handwriting and discovered that 63 teachers use letter tracing (74%), and 59 teachers use arrows and visual cues (69%). Interestingly, 79% (22) of all intermediate teachers use arrows and visual cues, one of the key components to promoting handwriting automaticity, while only 65% of primary teachers (31) use this method. Pencil grip and paper

positioning are emphasized more at the primary levels, while practice using commonly used letter combinations and fluency is emphasized more at the intermediate levels.

The use of arrows and visual cues plus writing from memory has shown to be one of the most effective ways to teach automatic letter writing (Berninger, 2009). In the survey, writing from memory is listed as "fluency (speed and legibility)." This study found only 20 teachers, or 24% of the respondents, use both instructional methods.

Table 4.3

Instructional Practices Used Teach Handwriting

Grade Level and Total Participants	% All Responses 85	Primary Level K-2 48	Intermediate Level 3-5 38	Multi-Age 9
Letter Tracing	63	37	19	7
	74%	77%	68%	78%
Arrows & Visual Cues	59	31	22	6
	69%	65%	79%	67%
Pencil Grip	54	39	8	7
	64%	81%	29%	78%
Paper Positioning	54	36	13	5
	64%	75%	46%	56%
Commonly used letter combinations	45	22	18	5
	53%	46%	64%	56%
Memorizing letter formations	33	23	5	5
	39%	48%	18%	56%
Fluency	31	16	13	2
	36%	33%	46%	22%
Arrows & Visual Cues Plus Fluency	20	8	11	1
	24%	17%	39%	11%

4.2 Programs and teaching materials

The survey participants indicated that they use a variety of handwriting programs. *Handwriting Without Tears* was used by 45 teachers (53% of all respondents). Many other programs were also listed, but all of these had less than 8 teachers using them. They included *Zaner-Bloser Handwriting*, *D'Nealian Handwriting*, and *Spalding*, which are better-known materials with a research-based track record.

Comments from this question such as, "I download it from the internet," point to the frequent use of non-standard materials, from sources like Teacher Pay Teachers, and even Target.

To the question, "How did you choose the program(s) you use in your classroom?" 40 teachers (47%) selected it for their classroom, 33 teachers (39%) indicated that the program was provided to them by their school, and only 3 teachers (4%) responded that the program they use is mandated by their school.

4.3 Participant opinions on handwriting instruction

The third section of the survey asked teachers about their opinions on handwriting instruction. Overall, the participating teachers in the Mat-Su Borough School District believe it is important to teach handwriting skills. When asked if providing specific instruction on "print" handwriting was important, 76 teachers (89%) agreed or strongly agreed with this statement, nine teachers (11%) were neutral, and zero teachers disagreed or strongly disagreed with the statement. The question about the importance of specifically teaching cursive handwriting was not as conclusive, yet 57 teachers (67%) indicated that they do believe it is important to teach cursive, while only 10 teachers (12%) believe it is no longer important to specifically teach cursive, and 18 teachers (21%) were neutral. When asked if they believe keyboarding skills are more important than handwriting skills in today's society, 11 teachers (13%) agreed or strongly agreed with this statement, 21 teachers (25%) indicated that they were neutral, and 53 teachers (62%) disagreed or strongly disagreed with this statement. The teachers who disagreed or strongly disagreed was greatest amongst the primary level, at 80% (38 primary teachers). Only 36% (10 intermediate teachers) held the same opinions.

Teachers in the district overwhelmingly feel that primary students should be given time to practice using a handwriting curriculum with 77 (91%) agreeing or strongly agreeing, and 7 (8%) were neutral. However, when asked the same question about the need for intermediate students to be provided time to practice using a handwriting curriculum, the agreement level dropped, with 62 (73%) agreeing or strongly agreeing and 20 (24%) of the respondents saying they were neutral. The next question asked the teachers their opinions about the statement, "There is no time to specifically provide handwriting

instruction during the school day." The responses were divided with 33 (39%) agreeing or strongly agreeing, 32 (38%) disagreeing or strongly disagreeing, and 20 (24%) being neutral. When these responses were looked at by level, a 46% of intermediate teachers (13) agree that there is time in the day to teach handwriting skills, while 33% of primary teachers (16) feel that they do not have time.

4.4 Final thoughts: an open-ended survey question

The fourth section of the survey asked for the participants' final thoughts on handwriting instruction and if they had ever received professional development on teaching handwriting skills. One of the startling findings in this study is that 84% of all the teachers who participated (71) have never received professional development on handwriting instruction. Of the 14 respondents that have received professional development, only two were at the intermediate level.

The final question asked respondents to share any other thoughts they had about teaching handwriting skills and the survey received a total of 35 comments. Seventeen primary teachers (35%) and 12 intermediate teachers (43%) took the opportunity to make comments. The comments were coded and some themes became evident. There were 13 teachers (15%) who commented about the importance of teaching handwriting skills. An example of this type of statement includes,

> I think providing handwriting through a program is needed for elementary kids. I think OT [occupational therapy] should be involved as well in early primary grades to help with the letter formation. In later grades I think it can be taught through other programs like I am doing with spelling mastery, either way it needs to be taught.

Ten teachers (12%) made comments about the importance of teaching cursive and often included concerns about time, as indicated in this comment below:

> By 5th grade, students should've at the point where I can give them a few reminders and some practice. If they haven't been taught any cursive at all, it's impossible for me to teach cursive from the ground up. I'm happy to practice and review and build fluency, but I don't have time to do what should have been done in 3rd and 4th grade.

Seven teachers (8%) made comments about the need for the district to have vertical alignment in handwriting instruction. An example includes,

> Until there is clear vertical alignment with handwriting instruction, it makes setting aside time seem like a waste. Students that have mastered cursive should no longer receive instruction, others should. We get a mix of skill levels, and that makes planning very difficult. In my ELA class, I teach it to those who need it, but in the context of another lesson.

Five teachers (6%) commented about how technology cannot replace handwriting, and include statements like, "Technology should not replace handwriting. We rely on technology too much in older grades." And only one comment stated that keyboarding is more important than handwriting instruction.

4.5 Summary of findings

The themes identified in the open-ended question included the importance of teaching handwriting skills, the importance of teaching cursive, and the need for handwriting instruction to be vertically aligned within the Mat-Su Borough School District. One finding indicates that 94%, or 80 of the participating general education elementary teachers in the Mat-Su Borough School District do teach some form of handwriting, but the form taught is different depending upon the grade level. Primary teachers teach print only (96%) and intermediate teachers teach cursive most often (82%). The methods used most often by all the teachers to teach handwriting include letter tracing and the use of arrows and visual cues; while the practice of handwriting fluency was only reported by 36% of the teachers. The teachers who participated in the study believe it is still more important to teach handwriting skills than keyboarding skills, and they most often agreed or strongly agreed that it is important to provide instruction on print handwriting, but fewer teachers believe instruction in cursive is important. The strongly supported position that handwriting instruction at the primary level is important (91% agreement) drops nearly 20 percentage points when asked of the importance at the intermediate level (agreement rate of 73%).

Chapter 5 Discussion, Recommendations, and Reflection

Before entering the discussion of recommendations for this study, it is important to look at how teachers in elementary schools can teach handwriting skills for automaticity. For review, automaticity is when a process can be completed swiftly, accurately, and without the need for conscious attention (Medwell & Wray, 2007). Indeed research has shown that 1) handwriting automaticity reduces short-term memory demand and allows for more resources to be used for composition (creating the thought); 2) the greatest time for the development of writing fluency is between 7 and 10 years of age (generally second through fourth grade in the United States); and 3) the use of number and arrow cues plus writing from memory are the instructional practices believed to be the most effective way to teach legible and automatic handwriting (Berninger et al., 2009; Berninger & Swanson 1994; Brooks et al., 1999; Medwell & Wray, 2007; Wicki et al., 2004). The results of the study will be discussed considering research-based best practices and in reference to the two research questions:

- Are teachers instructing handwriting skills at the primary and intermediate levels?
- What instructional methods are being used in the classroom to develop automaticity?

5.1 Are teachers instructing handwriting skills at the primary and intermediate levels?

In this study, 80 participating teachers (94%) in the Mat-Su Borough School District indicated that they do teach handwriting skills for print or cursive, while only five teachers (6%) indicated that they don't specifically teach handwriting skills at all. Although only 6% of all respondents are not teaching handwriting skills, this may indicate that these general education teachers do not understand the correlation between fluent handwriting skills, spelling, and text generation. It is also concerning because this percentage includes 17% of all second-grade teachers (2) in this study and 18% of all fifth grade teachers (2). A considerable developmental change in fluency improvement has been seen in children ages 7 to 10 (Wicki et al., 2014). "If a child's handwriting is not yet automated, the additional demands on cognitive resources related to the more complex task of text production easily overwhelms the cognitive system, resulting in poor text production performance" (Wicki et al., 2014, p.88). By not continuing to teach handwriting skills, these second and fifth grade teachers are not developing their

students' automaticity. This finding also supports the 7 teachers (8%) who made comments about the need for vertical alignment in elementary handwriting instruction in the District. This study also found that 100% of the 7 third-grade teachers who participated in the survey indicated that they teach cursive, while 3 (43%) of them indicated that they continue to teach print. This discrepancy in third grade indicates that even though the Mat-Su Borough School District has handwriting standards in third grade, they are not uniformly followed and may be too vague.

It is important that elementary students receive enough instruction and are given enough practice time to develop fluent handwriting. Hier & Eckert (2014) define fluency as the ability to write with speed and accuracy and state that writing fluency correlates with writing quality and achievement on criterion and standardized measures. Research done by Fitzpatrick et al. (2013) suggests that tactile feedback from forming letters may help composing because it activates multiple brain regions and that frequent practice (e.g., daily or 2 to 3 times a week) for short periods of time may lead to better learning than infrequent mass practice. Findings from this study show that 51 teachers (60%) from the Mat-Su Borough School District indicated that they teach handwriting skills more than 2 to 3 times a week; this includes 34 (71%) teachers at the primary level, but only 11 (39%) of the intermediate teachers. Thus, there is a need to increase awareness among intermediate teachers of the importance of frequent handwriting practice.

Findings also showed that there are 15 teachers (18%), who indicated that they teach handwriting skills occasionally or, not at all which could result in not enough practice time for students to develop automatic handwriting. In fact, 9 intermediate teachers (32%) said they teach handwriting skills only occasionally or not at all. When this intermediate groups' responses were looked at more closely, it was interesting to find that 7 (76%) of them indicated they do believe it's important to teach print and 6 (65%) of them believe it's important to teach cursive. These intermediate teachers were also more apt to agree or strongly agree (53%) that there is not enough time to teach handwriting skills and 4 (41%) of them agreed or strongly agreed that handwriting practice could be easily integrated into other subject area lessons. These opinions were also indicated in the open-ended survey responses by teachers, and as one teacher expressed, there was not enough time to 'catch-up' on cursive handwriting practice that had not been

taught by teachers in previous grade levels. These findings could be an indication that students in the classrooms may not be getting adequate practice time to develop automaticity not because the teachers do not believe the skills are important to teach, but because they believe there is not enough time to teach them, or that they can easily integrate handwriting skills into other subject area lessons.

So, are general education elementary teachers in the Mat-Su Borough School District teaching handwriting skills? Yes, most (94%) of the participants indicate that they do teach handwriting skills. However, there is a concern that more than a third of all intermediate teachers (32%) are only teaching handwriting occasionally, not at all, or as needed. Lack of resources, professional development, and vertical alignment are some of the reasons that current instruction may be limited.

5.2 What instructional methods are being used to develop automaticity?

As the literature review showed, handwriting instruction that combines arrow cues and writing from memory is one of the most effective ways to teach handwriting (Berninger et al., 1997). Additionally, direct instruction in handwriting is more important than incidental learning and providing students more opportunities to write from memory can increase handwriting automaticity (Fitzpatrick et al., 2013). This study reveals some concerning findings related to the instructional approaches utilized by teachers in the Mat-Su Borough School District. First, 63 teachers (79%) of all use letter tracing as a method of handwriting instruction while the use of arrows and visual cues was only indicated by 59 teachers (69%) and research shows using arrows and visual cues is a better teaching method than letter tracing alone. Second, only 31 teachers (36%) practice handwriting fluency, the practice of writing from memory to increase speed and legibility, with a larger percentage of intermediate teachers (46%) using this method than the primary teachers (33%). Third, this study identified the teachers who indicated that they use the instructional practices best found to promote automaticity: arrows and visual cues combined with writing from memory (presented in the survey as fluency) and found only 20 teachers (24%) use both of these teaching methods.

So, are the general education elementary teachers in the Mat-Su Borough School District using instructional methods to develop automaticity? No. They are not using best practices as indicated by the three concerns found in this study.

5.3 Recommendations

The findings in this study highlight a need for professional development on handwriting instruction, vertical alignment of handwriting standards, and district or school-level resources that support best practices in handwriting instruction. This study found that only 14 teachers (16%) have received professional development on handwriting instruction. The Mat-Su Borough School District's curriculum is lacking in handwriting standards for first and second grade, and this study found 2 primary (4%) and 3 intermediate (11%) of the teachers are not teaching handwriting skills at all. In addition, 15 teachers (18%) indicated that they only teach handwriting occasionally or not at all. This exemplifies why vertical alignment of the standards and curriculum throughout the grades and additional professional development is needed. Although 45 teachers (53%) indicated that they use the program *Handwriting Without Tears*, that leaves 40 teachers (47%) using different programs or found materials. Only 33 teachers (39%) in this study indicated that the handwriting materials they use in their classrooms are given to them by their school which leaves the other 52 teachers (61%) using their own resources and making programmatic decisions with very little professional development. These needs are supported by the evidence that only 20 teachers (24%) in this study are teaching handwriting skills with the methods known to promote automatic handwriting.

In summary, here are the recommendations to improve handwriting instruction in the general elementary classes of the Mat-Su Borough School District:

- The District needs to develop handwriting standards for all grade levels and vertically align the curriculum.
- General elementary teachers from kindergarten through fifth grade need professional development on the importance of handwriting instruction and the best instructional practices that develop handwriting automaticity.

- The District needs to provide resources to support the purchase of researched-based materials that support best practices and vertical alignment.

5.4 Reflection

When I started researching the topic of handwriting instruction, I thought it would be uncontroversial and well researched, with the best practices generally known and followed. Three years later and nothing could have been further from the truth. Handwriting is a deeply complex task that simultaneously requires cognitive linguistic and kinesthetic brain functions. The research was fascinating and when I found that the Alaska Standards for English Language Arts no longer specifically address handwriting skills beyond the first grade, I wondered how the students I work with learned how to form letters. I wanted to know how my fellow teachers are currently teaching handwriting skills and if the instructional methods they use are research-based. This led me to pursue a thesis and to develop a study that tried to answer these questions. Today, I realize that many elementary teachers in the Mat-Su Borough School District may be like I was, uneducated about the importance of students developing automatic handwriting. I hope my research is impactful and encourages the Mat-Su Borough School District to reconsider the role of handwriting in the English Language Arts elementary curriculum when the ELA curriculum writing team reconvenes.

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Appendix A Institutional Review Board Approval Letter

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Institutional Review Board

909 N Koyukuk Dr. Suite 212, P.O. Box 757270, Fairbanks, Alaska 99775-7270

November 15, 2019

To:	Carie Green Principal Investigator
From:	University of Alaska Fairbanks IRB
Re:	[1516707-1] How Do General Education School Teachers (K-5th Grade) in the Mat-Su School District Teach Handwriting Skills for Automaticity

Thank you for submitting the New Project referenced below. The submission was handled by Exempt Review. The Office of Research Integrity has determined that the proposed research qualifies for exemption from the requirements of 45 CFR 46. This exemption does not waive the researchers' responsibility to adhere to basic ethical principles for the responsible conduct of research and discipline specific professional standards.

Title:	How Do General Education School Teachers (K-5th Grade) in the Mat-Su School District Teach Handwriting Skills for Automaticity
Received:	October 28, 2019
Exemption Category:	2
Effective Date:	November 15, 2019

This action is included on the December 4, 2019 IRB Agenda.

Prior to making substantive changes to the scope of research, research tools, or personnel involved on the project, please contact the Office of Research Integrity to determine whether or not additional review is required. Additional review is not required for small editorial changes to improve the clarity or readability of the research tools or other documents.

Appendix B Mat-Su Borough School District Approval Letter

MATANUSKA-SUSITNA
BOROUGH SCHOOL DISTRICT

OFFICE OF INSTRUCTION

October 21, 2019

To Whom It May Concern:

The Mat-Su School District is aware of Rebecca Williams' research proposal on handwriting and will allow her to survey all kindergarten – fifth grade teachers in the Mat-Su School District regarding how they teach handwriting in their classrooms.

Before the survey can begin, Rebecca must have UAF's Institutional Review Board (IRB) approval. Participation in the survey must be optional for all teachers. Additionally, the results should not disclose any identifiable information.

Sincerely,

Amy Spargo

Assistant Superintendent of Instruction

Appendix C Survey

Survey on Teaching Handwriting In MSBSD

How Do Elementary Teachers in the Mat-Su Borough School District Teach Handwriting Skills

Informed Consent - Please Read

Hello, my name is Rebecca Williams and I am an instructional coach with the Mat--Su Borough School District at Sherrod Elementary and a graduate student in the School of Education at the University of Alaska Fairbanks. I am interested in learning more about handwriting instruction in MSBSD elementary schools. I am seeking your participation in a survey that I am conducting for my research project. I will share responses with my graduate committee and the Mat-Su Borough School District.

To participate in this survey you must be 18 years of age or older and your decision to participate in this project is voluntary. It should take you no more than 10 minutes to complete. There is minimal risk associated with taking this survey. The survey is completely confidential. Your name or other identifying information will be removed from the survey and replaced with a numeric identifier.

If you agree to participate in the survey, please click the "Next" button at the bottom of this page. By pushing the "Next" button, you are indicating that "I am 18 years of age or older," and that you are voluntarily agreeing to participate.

Thank you.

If you have any questions or concerns, please feel free to contact my professor, me, or University of Alaska's Office of Integrity, Institutional Review Board (IRB# 1516707-1):

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UAF – Office of Research Integrity – Institutional Review Board (IRB) uaf-irb@alaska.edu or 907-474-7800.
IRB#1516707-1 approval date: November 15, 2019

Skip to question 1

Handwriting Instruction

The following questions are about how you teach handwriting skills in your classroom.

1. 1. What grade do you currently teach?

Mark only one oval per row.

	Kindergarten	First	Second	Third	Fourth	Fifth	Multi-grade
Row 1	◯	◯	◯	◯	◯	◯	◯

2. 2. What type of writing skills do you teach? (check all that apply)

Check all that apply.

- ☐ Keyboarding
- ☐ Print
- ☐ Cursive
- ☐ I do not specifically teach writing skills

Other: ☐ _____

3. 3. How often do you teach a handwriting lesson?

Mark only one oval.

- ◯ Daily
- ◯ 2 to 3 times a week
- ◯ Weekly
- ◯ Occasionally
- ◯ Not at all
- ◯ Other: _____

4. 4. How long is your typical handwriting lesson and practice time?

Mark only one oval.

- Less than 15 minutes
- 15 to 30 minutes
- More than 30
- minutes Other:

_____

5. 5. Your handwriting instruction includes: (check all that apply)

Check all that apply.

- Letter tracing
- Arrows and other visual cues
- Pencil grip
- Paper positioning
- Practice with commonly used letter combinations
- Memorizing letter formations (an example might be: closing eyes and tracing letters in the air)
- Fluency (speed and legibility)

Other: _____

6. 6. How is the majority of your handwriting instruction taught?

Mark only one oval.

- Whole class instruction and participation
- Instruction during small groups
- Individually for identified students needing handwriting instruction
- Worksheet practice
- Homework
- I do not specifically teach handwritingOther:

_____

Skip to question 7

Handwriting programs and teaching materials

The following questions are about what programs and materials you use to teach handwriting skills.

7. 7. Which handwriting program(s) do you currently use in your classroom? (check all that apply)

Check all that apply.

- [ ] Daily Handwriting Practice (Evan Moore)
- [ ] D'Nealian (Pearson-Addison Wesley)
- [ ] Handwriting Without Tears (Handwriting Without Tears)
- [ ] Loops and Other Groups (by Mary Benbow)
- [ ] Zaner-Bloser Handwriting (Zaner-Bloser)
- [ ] Spalding Other:
  - [ ] _____

8. 8. How did you choose the program(s) you use in your classroom?

Mark only one oval.

- ◯ It is mandated that I use the program
- ◯ It is provided to me by the school
- ◯ I selected it for my classroom
- ◯ Other:

_____

Skip to question 9

Opinions on handwriting instruction

In this section you will be asked about your opinions on teaching handwriting .

9. 9. In today's society teaching keyboarding in elementary school is more important than teaching handwriting skills.

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	**Strongly Agree**

10. 10. Providing specific instruction on "print" handwriting is important.

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	**Strongly Agree**

11. 11. It is no longer important to specifically teach "cursive" handwriting.

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	**Strongly Agree**

12. 12. Primary students should be provided time to practice using a handwriting curriculum.

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	**Strongly Agree**

13. 13. Intermediate students should be provided time to practice using a handwriting curriculum.

Mark only one oval.

1	2	3	4	5

Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

14. 14. There is no time to specifically provide handwriting instruction during the school day

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

15. 15. Handwriting practice can be easily integrated into other subject area lessons.

Mark only one oval.

	1	2	3	4	5	
Strongly Disagree	◯	◯	◯	◯	◯	Strongly Agree

Your final thoughts

16. 16. Has your school ever provided professional development on teaching handwriting skills?

Mark only one oval.

◯ Yes
◯ No

17. 17. Please share any other thoughts you have about teaching writing skills?